TEA-PLANTING IN CEYLON

The Tea-Planter's Manual. By T. C. Owen. Pp. 162, with Coloured Lithographed Plates of an Iron and a Wood and Stone Tea Factory drawn to scale. (Colombo, Ceylon: A. M. and J. Ferguson, 1886)

EIGHT years ago, on account of the depression in the coffee industry of Ceylon, the prospects of the colony were of a sufficiently gloomy character. A great improvement has, however, been effected by the partial substitution of tea and cinchona for coffee, and by the general attention given to cacao, cardamoms, and other subsidiary subjects. Ceylon has also been fortunate in possessing a practical scientific institution in the Botanical Gardens of the colony; and its local press is enterprising and well-informed.

It is well to mention here that the excellent growth made by tea plants at the Perideniya and Hakgala Gardens fully justified the advocacy of tea-planting in Ceylon by the late Dr. Thwaites in his Annual Reports, while it is also due to the Colonial Office to state that through Lord Blachford it warmly supported the introduction of Assam tea plants into Ceylon in 1867. In 1877 Ceylon tea in commercial samples was submitted, through the Royal Gardens, Kew, to the Indian Committee of the Society of Arts, and the Report of this Committee clearly foreshadowed the high place which Ceylon tea has since taken in the London market.

The present manual is one of a series issued by the *Ceylon Observer* press, and is intended to be a complete hand-book to all the multifarious duties of a successful tea-planter. Colonel Money's "Essay," and the "Tea-Planter's Vade Mecum," both publications having special reference to the circumstances of Indian gardens, have hitherto been the only books on the subject.

As stated in the preface, Mr. Owen's manual "is more a compilation of the opinions of others and the results they have arrived at than an original work." The very valuable notes of one of the earliest and most successful of Ceylon tea-planters, Mr. Armstrong, of Rookwood, form an important portion of the book. The compiler wisely avoids an extended disquisition on the original home of the tea plant and on the question whether the "Assam tea tree" and the "China bush" are specifically distinct. In the latest works on the subject they are both included under *Camellia theifera*, Griff. There is no doubt that the Assam tea tree—for in a wild state it often reaches 40 to 50 feet in height—is indigenous to the mountainous district lying between South-Western China and the River Brahmaputra. It is probable also, although not clearly proved, that the China tea plant—of a somewhat shrubby habit—is derived from the same stock; although, as we now know, it was greatly altered by persistent cultivation for several centuries in a soil and climate different from those of its original home. The China tea plant has been found wild in no part of China. Under cultivation in Ceylon the Assam variety is suited to the plains, a hybrid form is sought for mid-elevations, while the China variety is useful only for the highest elevations up to 6000 and 7000 feet. Mr. Owen recommends that for all new plantations the best "jat" of Assam or hybrid plants should be obtained, as "no amount of care or skill will make up for a bad class of plant put into the garden at the outset." To a beginner in Ceylon, or to a planter in any other country, unacquainted with the particular methods pursued on Ceylon estates, the book would prove at first somewhat perplexing. Too much knowledge is assumed on the part of the reader as regards the important questions involved in the selection of land, while as regards the details of cultivation the particular "fads" and "fancies" of individual planters are too largely dwelt upon. It would have been more to the purpose to present a clear and simple statement of the first principles upon which the growth and culture of the tea plant, as a plant, should be based, in order to produce the best results. As regards the details of the manufacture of tea, quoting authorities is no doubt the best course, for the process of manufacture consists of a series of purely empirical operations, and a statement of principles alone would not meet the case After discussing selection of land (Chap. I.), varieties of the tea plant (Chap. II.), seed and nurseries (Chap. III.), lining, holing, and planting (Chap. IV.), field cultivation (Chap. V.), topping and pruning (Chap. VI.), plucking (Chap. VII.), and manufacture (Chap. VIII.), the writer devotes the remainder of the book to buildings and machinery (with plans), and to statistical returns connected with yield and cost of production.

The rapid progress made by the tea industry in Ceylon is exemplified by the fact that, while in 1878 only 282 pounds of tea were exported, during the past year (1886) the exports reached over 7,000,000 pounds. The probable exports in 1887 are placed at 12,000,000 pounds, while in 1888 they are expected to reach 30,000,000 pounds. So far, the price of Ceylon tea has maintained a slight advantage over Indian teas—the average price during 1885 being 1*s.* 3¼*d.* per pound for Ceylon tea, as against 1*s.* 1¼*d.* for Indian teas. The combined effect of large shipments of Indian and Ceylon teas will no doubt lead in time to a displacement of much that now comes from China. And while the general character of tea obtainable in European markets will improve, there obviously must come a fall in prices for which both Indian and Ceylon tea-planters must be fully prepared. At the Colonial and Indian Exhibition, thanks to the energy of Mr. J. L. Shand, Ceylon tea was admirably brought before the English public. Tea from Natal, Fiji, and a small sample from Jamaica were also shown; but the tea from Fiji possessed such special qualities that we shall probably hear more of this promising article.

To return to the subject of this notice, the "Tea-Planter's Manual" is a useful summary of the knowledge gained respecting tea-planting in Ceylon, and it embodies much valuable information for the use of practical planters. What fault there is to be found is not with the book itself, but with the system of cultivation it inculcates —a system which unfortunately appears to be adopted in the treatment of most tropical economic plants by European planters These plants are treated too purely as so many "rupee-making" machines. Too little attention is given to the characteristics and habits of the plants as living subjects, and too much to the details of an unsympathetic and essentially artificial system, already proved in Ceylon to be unsuited to the coffee plant, but into which there is now a strong tendency to force the

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tea plant. As there are diversities of soils and climates, so there are also diversities of industrial plants exactly suited to them. Where all such considerations are ignored, there is danger both to the plants and the planter; and this danger ought in the present case to be avoided.

D. M.

GEOMETRY

The Elements of Euclid. Books I.-VI. and part of Books XI. and XII. By H. Deighton. (Cambridge: Deighton, Bell, and Co., 1886.)

Euclid Revised. Book I. with Additional Propositions and Exercises. Edited by R. C. J. Nixon. (Oxford: Clarendon Press, 1886.)

Euclid Revised. Books I. and II. (Same Editor and Publishers.)

First Lessons in Geometry, for the Use of Technical, Middle, and High Schools. By B. Hanumanta Rau. (Madras: Addison and Co., 1885.)

The Origins of Geometry. By Horace Lamb, F.R.S. (Manchester: Cornish, 1886.)

THE author of the first of these books attempts to "give a translation of the Greek text of a somewhat more modern form than the mere verbal ones [what does he mean?] in general use; and, whilst strictly adhering to Euclid's methods, to render his reasoning as clearly and concisely as possible." Hence our presentment of the title-page is supplemented in the original work by the words "newly translated from the Greek text with supplementary propositions, chapters on modern geometry, and numerous exercises." It will be evident that this is Euclid pure and, as far as the author is able to render it, unadulterated; there is no *revision* here such as Mr. Nixon provides for the reader. Mr. Deighton has, however, studied the "Syllabus" (of the A.I.G.T.) and has here and there introduced, with fitting acknowledgment, extracts from it. Further, the author is evidently actuated by the same motives as those which lead the Association to attach so much weight to the solution of geometrical problems as evidence of a student's grasp of the text. A strong feature is the large number of exercises (1419 in all, besides worked out examples), especially of an elementary character, in close proximity to the propositions upon which their solution depends. At the end of the first book are given the enunciations of several propositions which certainly should be mastered by anyone who wishes to gain a sound acquaintance with elementary geometry. Following, it may be, the example of other recent text-books, an excellent collection of the most important propositions on the radical axis, poles and polars, harmonic proportion and centres of similitude are given; there is also a chapter on transversals. The selection of exercises is not confined to Cambridge papers, but levies have been made on the well-known works of Catalan, Rouché, de Comberousse, and Spieker. There are also remarks on plane loci and on the solution of geometrical questions. The letterpress is clear, and the figures are in the main distinctly and carefully drawn, but several monstrosities appear in the third book, as of old, and the drawings on pp. 115, 153, 186 are incorrect as to relative measurements. Perhaps when Mr. Nixon has examined the present book he will modify a statement in his preface (p. vii., we refer to the work reviewed in these columns, vol. xxxiv. p. 50, by R. B. H.) to the effect that "there does not exist a modern edition which gives *Euclid pure and simple.*"

The second and third books are the corresponding portions of the larger work referred to above, reprinted page for page, with the addition of an appendix, in which are given proofs of omitted propositions, and also of i. 5 and of i. 8 as a deduction from i. 7. "This addition is made at the request of several teachers. It is of course a concession to the omnipotent examiner; and, as such, is made with much reluctance." One can only regret that a writer who has taken up so advanced a position should have yielded on this point.

The fourth book is interesting as giving evidence of how a modern movement has taken hold of able mathematical teachers of the mild Hindoo. Mr. Rau candidly repudiates all claim to originality for his matter, as in its compilation he has consulted the best English and French text-books both for pure as well as for practical geometry. "If 'Euclid's Elements' is unsuited for beginners who study it in their own native tongue, how much more so should it be in this country, where it is taught in classes consisting generally of lads between ten and twelve, before they have had time to master the difficulties of a foreign language, and before too, I may add, they can benefit by its rigorous logic. The result, as may be anticipated, has been highly prejudicial to the study of geometry and of mathematics in general. With a view, if possible, to remedy the evil, of which I had become painfully conscious in the course of my several years' experience as a mathematical teacher in schools and colleges, I had long been anxious to attempt a departure from the established route." The work consists of the notes he drew up for the pupil-teachers and students under his charge. "My success in the experiment is my justification for publishing this little volume." The figures are roughly drawn, and the cover is a paper one, but the contents are carefully arranged, and furnish a very fair amount of geometrical information for the class aimed at all the propositions being looked at with an eye to their practical utility. Such a class should know how to hold an object "in an oblique position, not permitting it to retrograde to the perpendicular."

"The Origins of Geometry" is an address delivered at the opening of the Owens College session, October 5, 1886. The Professor of Mathematics casts "a rapid glance over the early history of our science, more especially of that branch of it which was first cultivated with success, geometry." Taking Hankel as his guide, he glances rapidly at matters of which Dr. Allman has treated in much fuller detail; he then treats of what has proved "the most formidable obstacle to the further progress of Greek mathematics, the divorce between geometry on the one hand, and arithmetic and algebra on the other. This had its origin in the discovery of incommensurable magnitudes by Pythagoras and his successors." He, by the way, notes that "the greatest advances in mathematics have been made by men whose interest in the subject was of a speculative kind." The address winds up with the question, "What is likely to be the relation of mathematics to the science of the future?" Prof. Lamb

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